

from devoting his holidays to study when he ought to be gaining physical strength and enjoying mental relaxation?

THE Emperor of Germany has given his consent to further reforms in the educational systems of the higher schools of Prussia, and a summary of the edict is given in the *Times*. The general education received in the three kinds of schools, the Gymnasium, the Realgymnasium and the Oberrealschule, is to be regarded as of the same value, and as only requiring to be supplemented in so far as for several branches of study and for several professions special preliminary knowledge is necessary which is not included in the curriculum of all three institutions. In accordance with this consideration, the desirability of extending the privileges of the Realgymnasien and the Oberrealschulen is to be kept in view. By this means it is hoped to raise these schools in public estimation, and to render an acquaintance with modern subjects more general. In view of the great importance of a knowledge of English, his Majesty lays stress upon the necessity of giving more attention to that subject in the Gymnasium. English is to be taught as an alternative subject to Greek in all the classes of those schools, except the three highest. Where the local conditions are favourable to the alteration, English is to take the place of French as a compulsory subject in the three highest classes. French, however, is to be retained as a voluntary subject wherever this change is made. The Emperor further regards it as advisable that more time should be given to geography in the higher Realschulen than has hitherto been the case. In the teaching of modern languages importance is to be attached to fluency in speaking and to the understanding of current authors.

#### SCIENTIFIC SERIALS.

*Bulletin of the American Mathematical Society*, November.—The only paper in the present number is a note on geometry of four dimensions, by Prof. Lovett, which was read before this society on April 28 of this year. The writer indicates nine well-defined "trends" which the speculations relative to the geometry of  $n$ -dimensional space have followed, and directs his work to following up two out of these, viz., the interpretation of this geometry in the light of the theory of groups as exhibited by Lie, Klein and Poincaré and the extension of the methods of ordinary differential geometry to general spaces, i.e. as worked out by Christoffel, Beltrami, Cesáro, Darboux and others. This he does by constructing four dimensional space by the method of Lie's theory of continuous groups, and studying curves of triple curvature by the intrinsic analysis developed by Cesáro in his *Lezioni di geometria intrinseca*.—An account of the proceedings at the recent International Congress held at Paris is furnished by Miss C. A. Scott, in which she abstracts the addresses by Prof. Cantor, sur l'historiographie des mathématiques, and Prof. Volterra, trois analystes italiens, Betti, Brioschi, Casorati. Several of the papers communicated are lightly but clearly handled, and M. Poincaré's presidential address, du rôle de l'institution et de la logique en mathématiques, is concisely analysed. She plainly speaks her mind on many points of detail.—Dr. G. A. Miller gives an account of the 49th Annual Meeting of the American Association for the Advancement of Science so far as it relates to the work of the society. The meeting was held at Columbia University, June 23–30, and from the point of view of scientific work it is said to have been one of the most successful that has been held by the association. About twenty papers were read in section A., some of which are given in brief abstract.—In the "notes" additional particulars (to those given in the October number) are given of the mathematical courses to be followed in the coming winter at British and Continental colleges.—Personal details as to deaths and new appointments, with the usual "new publications," close the number.

IN a paper on new and critical British Alge, in the *Journal of Botany* for October, Mr. E. A. L. Batters describes no less than three new genera of sea-weeds:—*Neevea*, belonging to the Bangiaceae, represented by *N. repens*, endozoic on *Flustra foliacea* at Deal; *Rhodophysema* (Florideæ), founded on *R. Georgzi*, growing on *Zostera marina* off the Scilly Islands; and *Erythrodermis* (Florideæ), represented by *E. Alleni*, dredged up from 4–6 fathom water at Plymouth.—In the number for November Mr. Pearson describes and figures a new liverwort, *Lejeunea Macfarlanei*, from Inverness-shire; and Mr. E. S. Salmon a new parasitic fungus belonging to the Erysiphæ, *Uncinula septata*, from Japan.

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#### SOCIETIES AND ACADEMIES.

##### LONDON.

**Royal Society**, November 15.—"Data for the Problem of Evolution in Man. VI.—A First Study of the Correlation of the Human Skull," by Alice Lee, D.Sc., with some assistance from Karl Pearson, F.R.S., University College, London.

November 22.—"On the Restoration of Co-ordinated Movements after Nerve Crossing, with Interchange of Function of the Cerebral Cortical Centres." By Robert Kennedy, M.A., D.Sc., M.D.

**Zoological Society**, November 20.—Dr. W. T. Blanford, F.R.S., Vice-President, in the chair.—Mr. Slater stated that during a recent short stay at Gibraltar he had visited the haunts of the Barbary Ape (*Macacus inuus*), at the top of the Rock, and had ascertained that the herd of these animals was in a flourishing condition, and had considerably increased during the last few years. An extract was read from a letter from Sir Harry Johnston, K.C.B., containing indications of a supposed new species of the Horse-family (Equidæ) which appeared to inhabit the Great Congo Forest, near the Semliki River, East Africa.—Mr. G. A. Boulenger, F.R.S., exhibited and made remarks on one of the type-specimens of a new species of *Protopterus* from the Congo, for which he had proposed the name of *Protopterus doloi*.—Dr. W. T. Blanford, F.R.S., exhibited and made remarks upon a very fine pair of horns and some skins of the Central-Asiatic Wapiti, lent to him for examination by Mr. Rowland Ward.—Mr. F. E. Beddard, F.R.S., read a paper on the Osteology of the Pigmy Whale (*Neobalaena marginata*), based mainly on an examination of one of the specimens of this animal in the British Museum. A detailed description of the skeleton was given, and the features in which it differed from that of other known forms of the Cetaceans were pointed out.—Prof. Howes, on behalf of Prof. Baldwin Spencer, F.R.S., gave a description of *Wynyardia basiana*, a fossil Marsupial from the Tertiary Beds of Table Cape, Tasmania. It was remarkable as being the first fossil Marsupial obtained from the Tertiaries of Australia, and appeared to be a Polyprotodont, having affinities with the Didelphid, Dasypurid, and Phalangistid series, which had probably struck off from the rootstock at the period at which the Diprotodonts were in course of evolution.—A communication from Mr. L. A. Borradaile contained an account of a collection of Arthrostracans and Barnacles from the South Pacific.—Mr. Oldfield Thomas read a paper on the Mammals obtained by Dr. Donaldson Smith during his latest expedition from Somaliland by Lake Rudolf to the Upper Nile. Twenty-three species were enumerated, and five forms described as new. Dr. Smith had also obtained some fine examples of the true Bohor of Rüppell (*Cervicapra bohor*) and of the Bush-buck described by Heuglin as *Tragelaphus bor*, which proved to be a tenable sub-species of *T. scriptus*.—Mr. W. L. Distant read a paper on the Rhynchota belonging to the family Pentatomidae in the Hope Collection at Oxford. It constituted a revision of the catalogue of the Hope Collection written by the late Prof. Westwood in 1837. All the specimens had been examined by the author, and the species relegated to modern genera and much synonymy removed, while several new genera were described in the paper.—A communication was read from Mr. R. C. Punnett, containing an account of the Nemerteans collected by Prof. Haddon in Torres Straits. They comprised examples of seven species, four of which had been previously described, whilst the remaining three were new.

**Royal Meteorological Society**, November 21.—Dr. C. Theodore Williams, President, in the chair.—A communication was read from the International Meteorological Committee inviting observations of the form, amount and direction of the clouds on the first Thursday of each month during 1901, as well as on the preceding and following days. These observations are to be made in connection with the balloon ascents which will be carried out under the direction of the Aérostation Committee.—Mr. R. H. Curtis exhibited an improved mounting for the lens and bowl of the Campbell-Stokes sunshine recorder, by means of which the glass ball can be quickly and accurately placed centrally in the bowl, where it is secured by clamping screws.—Mr. W. H. Dines read a brief paper on the weekly death-rate and temperature curves, 1890–99. He exhibited diagrams showing the death rate of the thirty-three great towns of England, and also curves of the temperature at Greenwich. The author is of opinion that, from the health point of view, the English climate is one of the best in

the world, and this is proved by the relatively low rate shown in these curves. A pleasanter climate may well be found, but the majority of health resorts to which Englishmen resort in the winter have a higher death rate than London has at the same season, and a far higher rate than any of the country districts of the British Isles.—Mr. H. Mellish also read a paper on the seasonal rainfall of the British Islands. After referring to what had already been written on the subject by others, he proceeded to discuss the data contained in the "Tables of Rainfall, 1866-90," published by the Meteorological Council. He concluded by saying that, as regards the relation between the amount which falls in the wettest and the driest month at any station, it seems to be generally the case that the range is larger for wet stations than for dry ones.

**Entomological Society.** November 21.—Mr. G. II. Verrall, President, in the chair.—Mr. H. W. Andrews exhibited *Atherix crassipes*, Mg., a Dipteron new to the British list, taken near Ticehurst, Sussex. Mr. Verrall remarked that it was a distinct species, and, like *Leptis*, affected the leaves of alder.—Colonel Yerbury exhibited *Anthrax paniscus* and *Tubanus bromius*, bred from a lepidopterous pupa found in sand at St. Helen's, Isle of Wight, and a new species of *Cordylura*, taken at Aviemore in July 1899 and June 1900.—Mr. L. B. Prout exhibited three male specimens of *Proutia betulina*, Z., and two of *P. eppingella*, Tutt, bred from larvæ taken this season in Epping Forest. He remarked that both species occurred in the same part of the forest, and the larvæ appeared to be attached chiefly to old hawthorns. Excepting in the smaller size of *P. eppingella*, no superficial difference was observable between the two species. The specimens of *P. betulina*, however, emerged about ten days earlier.—Dr. Chapman exhibited some specimens of considerable interest in relation to the question of correspondence or otherwise of the pupal and imaginal wings of *Aporia crataegi*, showing that at this particular stage the imaginal wings presented the markings of the pupal wing, a set of markings which are in a way the reverse of those of the mature imago. He also exhibited specimens of the wings at a later stage, showing the true imaginal markings developed. With regard to these effects, Dr. Chapman explained them to some extent as analogous to photographic effects. It was quite possible, he thought, that light and heat caused a differential effect through the different coloured areas of the pupa.—Papers were communicated on contributions to a knowledge of the Rhyncota, by Mr. W. L. Distant, and an account of a collection of Rhopalocera made at Zomba, British Central Africa, by Mr. P. T. Lathy.

#### MANCHESTER.

**Literary and Philosophical Society.** November 27.—Mr. J. J. Ashworth, Treasurer, in the chair.—Dr. Wilson mentioned a peculiarity to which his attention had been called in reference to the bursting of gauge glasses on the engines in the laboratory at the Owens College. It appears that an interval of perceptible length occurs between the first appearance of a longitudinal crack in the glass, from which the steam issues, and the actual burst. The interval was sufficiently long on one occasion to allow the fireman to shut off the steam before the tube collapsed. If the interval be found to occur generally, it is of obvious importance.

#### DUBLIN.

**Royal Dublin Society.** November 21.—Prof. G. F. Fitzgerald, F.R.S., in the chair.—Prof. J. Emerson Reynolds, F.R.S., presented notes on some recent advances in chemical science illustrated at the Paris Exhibition.—Mr. J. R. Wigham described a method of burning petroleum under pressure for lighthouses and other places where an extremely powerful light is required, and exhibited a working model of the apparatus.—Prof. J. Emerson Reynolds exhibited a series of photographic slides showing various parts of the Paris Exhibition.—Dr. W. E. Adeney exhibited and described the Michelson Echelon spectroscope.—Mr. R. M. Barrington showed a collection of the wings of birds killed by striking Irish lighthouses in their flight.

#### PARIS.

**Academy of Sciences.** November 26.—M. Maurice Lévy in the chair.—Action of the earth's magnetic field upon the behaviour of a magnetised chronometer, by M. A. Cornu. As the

result of the experiments cited, the conclusion is drawn that it is possible to correct the action of a magnetic field upon a magnetised chronometer, either by a correction formula or by the use of compensators.—On the existence of the nitrides of neodymium and praseodymium, by M. H. Moissan. A claim for priority against M. Matignon.—M. Haller was elected a member of the section of chemistry in the place of M. Ed. Grimaux.—On the definition of certain surface integrals, by M. H. Lebesgue. On fundamental functions and the problem of Dirichlet, by M. W. Stekloff.—On orthogonal systems admitting a continuous transformation group of Combescure, by M. Maurice Fouché.—Solution of a problem of elastic equilibrium, by M. Ivar Fredholm.—On the study of distant storms by means of the telephone, by M. Th. Tommasina. By the use of a coherer and a telephone each change of sign of atmospheric electricity shown on the electro-radiograph of M. Boggio Lera is shown to be accompanied by a sound in the telephone, giving rise to the illusion that the storm is quite close. The apparatus may possibly be of use at sea.—Actinometric measurements at Pamir, by M. B. W. Stankewitch. Observations were made at the passes of Taldik (3590 metres), Kisil Art (4220 metres), and Ak Baital (4650 metres).—On the magnetisation of electrolytic deposits of iron obtained in a magnetic field, by M. Ch. Maurain. Two curves are given, one showing the ordinary magnetisation curve of a deposit obtained as little magnetised as possible, the other the intensities of magnetisation of deposits obtained in constant fields up to 800 C.G.S. units.—Apparatus for localising despatches in wireless telegraphy, by M. Paul Jégou.—Cryoscopic researches, by M. Paul Chroustchoff. The measurements were made with a Callendar and Griffiths electrical thermometer, reading to 0°0001 C. Experimental results are given for salt, sugar, potassium bromide and sulphate.—New method of estimating arsenic, by M. O. Ducru. In a solution containing ammoniacal salts, and slightly alkaline with ammonia, arsenic acid is completely precipitated by cobalt salts. The precipitate may be treated in one of three ways, dried at 100°, ignited at a low red heat, or the cobalt determined electrolytically, of which the first and third appear to give the best results.—On a general method of separation for the metals of the platinum group, by M. E. Leidié. Metals other than those belonging to the platinum group are eliminated, and the remaining metals transformed into double nitrites. Soda is added to the liquid, and the osmium and ruthenium distilled off in a current of chlorine. The iridium and rhodium are precipitated as double nitrites with ammonium nitrite, and the residual palladium and platinum separated in the usual way.—Direct combination of hydrogen with the metals of the rare earths, by M. Camille Matignon. Neodymium, praseodymium and samarium combine rapidly and completely with hydrogen, the hydrides being dissociable.—On some chlorobromides of thallium, by M. V. Thomas. A description of the method of preparation and properties of the chlorobromide,  $TlCl_2Br_4$ .—On the selenide of cadmium, by M. Fonzes-Diacon. Crystallised cadmium selenide,  $CdSe$ , is rhombohedral, and isomorphous with zinc selenide obtained under similar conditions.—Examination of mineral waters for metals present in minute proportions, by M. F. Garrigou.—On the nitration of di-substituted derivatives of benzene, by M. Ch. Cloez.—Action of nitric acid upon tribromoguaiacol, by M. H. Cousin. Nitric acid gives a quinone, which is the result of a simultaneous condensation and oxidation.—On the presence of seminase in seeds containing horny albumen, by MM. Em. Bourquelot and H. Hérissey. Experiments were made on the seeds of lucerne (*Medicago sativa*) and indigo (*Indigofera tinctoria*). These contain, before germination, a small proportion of a soluble ferment, seminase, capable of liquefying their horny albumen and transforming it into assimilable sugars, these sugars forming the first nutriment of the embryo at the commencement of its development.—Osmotic communication in the normal marine invertebrate, between the internal and external media of the animal, by M. R. Quinton.—The adipose body of the Muscides during histolysis, by M. F. Henneguy.—Experiments on teleogony, by Mlle. Barthéléty.—On polymorphism of stems in a single species, by M. Marcel Dubard. The Miocene basalts in the neighbourhood of Clermont, by M. J. Giraud.—The effects of working certain groups of muscles, upon others which do no work, by Mlle. I. Ioteyko. A discussion of the previous note of MM. Kronecker and Cutter upon the same subject.—Seasonal variations of temperature at different heights in the atmospheres, by M. Léon Teisserenc de Bort.

## NEW SOUTH WALES.

Royal Society, September 5.—The President, Prof. Liveridge, F.R.S., in the chair.—The language, weapons and manufactures of the aborigines of Port Stephens, New South Wales, with two plates, by W. J. Enright.—The past droughts and recent flood at Lake George, by H. C. Russell, C.M.G., F.R.S. It was shown that at the end of 1874 Lake George was at its maximum depth during the past seventy years, the depth then being 24 ft.; from that date the water gradually decreased, rising sometimes during heavy rains, and on February 25, 1877, the water was only 10 ft. 9 in. deep. At this time the author put up an automatic gauge, which recorded every change until it became too low for the machine to work, and exact measures were then carried on by hand. Meantime the level varied with the seasons, until in 1890, a very wet year, the lake was 12 ft. 11 in. deep; and after this the lake level fell faster than ever recorded before, and on March 28, 1900, the depth was only 0 ft. 10 in., a fall of 12 ft. 1 in. in six years. During 1895 the evaporation was most rapid, the hot and windy weather carried the water away, not only by evaporation but also as spray into the forest, and the total loss of water in that year was 5 ft. 4 in.—Note on an obsidian "bomb," by R. T. Baker. The specimen described in this note is not quite perfect—a portion having been broken off when it was discovered. It has a form quite unusual to those previously recorded from Eastern Australia, but resembles those from Western Australia and the interior of the continent. It is not unlike one found in Tasmania in 1897. It is sub-globose in shape, the surface being much indented with air pores and globulites; it has a very dark green or almost black, glassy appearance, and measures 1 in. in diameter, and  $\frac{1}{2}$  in. in thickness, and has a specific gravity of 2.456 at  $15^{\circ}\text{C}$ . It was found at O'Connell, near Bathurst, by Messrs. A. Walkes and Lester, some feet below the surface, whilst sinking for gold.

## GÖTTINGEN.

Royal Society of Sciences.—The *Nachrichten* (physico-mathematical section), part 2 for 1900, contains the following memoirs communicated to the Society:—

April 9.—W. Voigt: On the present state of our knowledge of the elasticity of crystals (report for the Paris International Congress of Physics).

February 3.—E. Landau: The function  $\phi(n)$  in the theory of numbers, and its relation to Goldbach's theorem.

May 19.—H. Winkler: On the segmentation of unfertilised ova under the influence of sperm-extracts.—G. Mittag-Leffler: On the generalisation of Taylor's theorem.

June 30.—E. Ehlers: Magellanic annelids, collected by the Swedish Expedition to the Straits of Magellan.—J. Orth: Researches at the Göttingen Pathological Institute (Report vii.).

## DIARY OF SOCIETIES.

THURSDAY, DECEMBER 6.

Royal Society, at 4.30.—The Histology of the Cell Wall, with Special Reference to the Mode of Connexion of Cells. Part I. The Distribution and Character of "Connecting Threads" in the Tissues of *Pinus sylvestris* and other Allied Species: W. Gardiner, F.R.S., and A. W. Hill.—On the "Blaze Currents" of the Frog's Eye-ball: Dr. Waller, F.R.S.—On a Bacterial Disease of the Turnip (*Brassica napus*): Prof. M. G. Potter.—The Micro-organism of Distemper in the Dog, and the Production of a Distemper Vaccine: Dr. S. M. Copeman.—On the Tempering of Iron Hardened by Overstrain: J. Muir.

Chemical Society, at 8.—Ballot for the Election of Fellows.—Santalenic Acid: A. C. Chapman.—Ammonium Bromide and the Atomic Weight of Nitrogen: A. Scott, F.R.S.—Interaction between Urethanes and Primary Benzoid Amines: Dr. A. E. Dixon.—The Decomposition of Chlorates. Part III. Calcium Chlorate and Silver Chlorate: W. H. Sodeau.—Nitride of Iron: Gilbert J. Fowler.—The Heat of Formation and Constitution of Iron Nitride: Gilbert J. Fowler and Philip J. Hartog.—Relationships of Oxalic Acid: H. J. H. Fenton, F.R.S., and H. O. Jones.

Röntgen Society, at 8.—Exhibition and Description of a Stereoscopic Fluoroscope and a New Rotary Mercury Break: J. Mackenzie Davidson.

Linnean Society, at 8.—On some New Foraminifera from Funafuti: C. Chapman.—On British Thrifts: G. Claridge Druce.

Institution of Electrical Engineers, at 8.—Continuation of Discussion on Mr. Langdon's paper.

FRIDAY, DECEMBER 7.

Institution of Civil Engineers, at 8.—Dock Gates: F. K. Peach.

Geologists' Association, at 8.—The Zones of the White Chalk of the English Coast. II. Dorsetshire: Dr. A. W. Rowe.

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## MONDAY, DECEMBER 10.

Royal Geographical Society, at 8.30.—Expedition to the Barotse Country and through Africa to the Nile: Major St. Hill Gibbons.

Society of Arts, at 8.—Electric Oscillations and Electric Waves: Prof. J. A. Fleming, F.R.S.

## TUESDAY, DECEMBER 11.

Institution of Civil Engineers, at 8.—The Signalling on the Waterloo and City Railway; and Note on the Signalling of Outlying Siding Connections: A. W. Szlumper.—Signalling on the Liverpool Overhead Railway: S. B. Cottrell.

## WEDNESDAY, DECEMBER 12.

Society of Arts, at 8.—The Treatment of London Sewage: Prof. Frank Clowes.

## THURSDAY, DECEMBER 13.

Royal Society, at 4.30.—Probable papers: On the Spectrum of the More Volatile Gases of Atmospheric Air, which are not Condensed at the Temperature of Liquid Hydrogen. Preliminary Notice: Prof. Living, F.R.S., and Prof. Dewar, F.R.S.—Additional Notes on Boulders and other Rock Specimens from the Newlands Diamond Mines, Griqualand West: Prof. Bonney, F.R.S.—The Distribution of Vertebrate Animals in India, Ceylon and Burma: Dr. W. T. Blanford, F.R.S.—Elastic Solids at Rest or in Motion in Liquid: Dr. C. Chree, F.R.S.

Mathematical Society, at 5.30.—The Syzygetic Theory of Orthogonal Bivariants: Prof. Elliott, F.R.S.—On Discriminants and Envelopes of Surfaces: R. W. Hudson.—Note on the Inflexions of Curves with Double Points: H. W. Richmond.—On some Properties of Groups of Odd Order, ii.: Prof. Burnside, F.R.S.

Institution of Electrical Engineers, at 8.—Possible continuation of Discussion on Mr. Langdon's paper.—Time permitting: Rapid Variations in the Current through the Direct Current Arc: W. Duddell.

Chemical Society, at 8.30.—Rammelsberg Memorial Lecture: Prof. H. A. Miers, F.R.S.

## FRIDAY, DECEMBER 14.

Physical Society (Royal College of Science), at 5.—(1) Electric Inertia: (2) The Effect of Inertia on Electric Currents in a Rotating sphere: Prof. A. Schuster, F.R.S.—Exhibition and Description of a Quartz-Thread Gravity-Balance: Prof. R. Threlfall, F.R.S.—On the Theory of Magnetic Disturbances by Earth Currents: Prof. A. W. Rücker, F.R.S. Notes on the Practical Application of the Theory of Magnetic Disturbances by Earth Currents: Dr. R. T. Glazebrook, F.R.S.—The New Physical Laboratories of the Royal College of Science: Prof. A. W. Rücker, F.R.S.—Exhibition of a Set of Half-Seconds Pendulums: W. Watson.

Royal Astronomical Society, at 8.

Malacological Society, at 8.

Institution of Mechanical Engineers, at 8.—Power-Gas and Large Gas-Engines for Central Stations: H. A. Humphrey.

## SATURDAY, DECEMBER 15.

Essex Field Club (Essex Museum of Natural History, Stratford), at 6.30.—Notes on the Mollusc *Paludestrina jenkinsi*, Smith, in Essex and elsewhere: A. S. Kennard and B. B. Woodward.—Aquatic Autocrats and Fairies (Lecture): Fred. Enoch.

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